

According to the Martin Prosperity Institute (USA), Belarus is ranked 37th in the Global creativity index – the highest place among the CIS countries. Parameters such as technology, talent, and tolerance were examined. According to the world Intellectual Property organization (WIPO), Belarus increased its rating in 2019 and took the 72nd place out of 129 economies in the world. This is 14 positions higher than it was last year, which indicates the growth of innovation, investment and improvement of the state's scientific and technical base.

**Conclusion.** Thus, the creative economy is a developing and emerging mechanism of the post-industrial economy, which has replaced the industrial type of development of society, and is inextricably linked with the innovation economy. The basis of the creative economy is intellectual property. In Belarus, the creative economy is still in its infancy, but the country has a good chance to develop this type of economy, taking into account the available resources and opportunities, as well as increasing innovation and attracting investment from abroad.

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### HOW RAY TRACING AFFECTED NVIDIA

**А.А. Быченков**, студент группы 10504119 ФММП БНТУ,  
научный руководитель - старший преподаватель **Н.Н. Перепечко**

*Summary - in this article, we will talk about how the entry of a new video card segment into the market affected the profit of one of the most famous video card companies. And also whether the market itself is ready for such innovations. Analysis of what this technology does and how it can help developers.*

*Резюме – в данной статье речь пойдет о том, как выход на рынок нового сегмента видеокарт повлиял на прибыль одной из самых известных компаний по выпуску видеокарт. А также готов ли сам рынок к таким нововведениям. Анализ того, что делает эта технология и как она может помочь разработчикам.*

**Introduction.** On September 20, 2018, a new video card segment from Nvidia, namely the 20 series, entered the shelves of electronics stores. It included video cards: RTX 2060, RTX 2070, RTX 2080 (as well as manufacturer-accelerated versions of Ti). This is a completely new type of video card on the market. The fact is that they are the first to introduce RTX technology. They allow the user to work with ray tracing.

**The main part.** Ray Tracing is a set of algorithms that allow you to achieve photorealistic graphics, they allow you to implement next-generation lighting effects that look as realistic as possible: scattered shadows, background darkening, reflections, refraction..., and much more in fact. It's also worth adding that ray tracing simplifies the video game development pipeline. Rasterization also requires additional game resources, which are worked on by a lot of artists and designers, adjusting reflections and other things in the graphics editor so that they look realistic in the game. Rasterization outputs objects in turn, one after the other, so there is no relationship between the objects. You can also use this technology in conjunction with AI: for example, use it to calculate the vision of bots-launch beams from bots and see where they collide with objects. This is necessary so that bots can determine where other objects are located in the three-dimensional scene. This allows bots to behave more correctly than in the case of scripted behavior. You can also use ray tracing technology to calculate physics: for example, use rays to calculate the point where objects collide with each other».

As an example, we can present a game production company. Graphic design plays a major role in creating a new product. We can also say that about 30-40% of the budget spent on the game is made up of graphic effects. Video cards with this technology allow you to spend much less time and money on this type of work.. A clear example of how this technology works. In this case, it does everything automatically, without spending time creating these things manually.

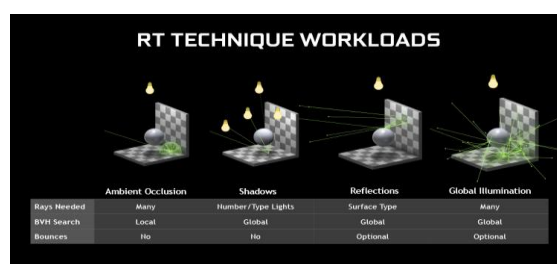


Illustration 1- RT technique workloads

Source: Nvidia.com. An example of the work technology.

If we talk about people who do not work in such companies, we can distinguish those who work with video editing. The fact is that this technology is associated with the PP (Picture in Picture) technology, which reduces the time of rendering a video by 20-30%.

From these examples, we can conclude that this technology gives a sufficient advantage when working with video materials. However, it has 1 significant drawback-the price. The fact is that this is a new technology and for its stable operation, you need high-performance video cards (the RTX line presented above), and their prices are from \$2500. In this price segment, there are video cards without this technology, but at the same time, showing better performance. On weaker video cards, this technology is extremely unstable. From this we can conclude that the average person does not make sense to buy video cards with this technology.

In the financial report for the 4th quarter of 2018, we can note that the company's profit increased by 34% compared to the 3rd quarter. This was caused by a stunning advertising campaign, with the participation of the world brand Electronic Arts. Many large companies, such as EA, Activision, Ubisoft, and Sony have implemented this technology in the production of their games. However, as stated in the same report : only 70% of these video cards were purchased in stores or outlets.

This has affected the company's future. Because many major game studios have already bought these video cards, it remains to sell them to ordinary people, but because of the high price, they did not sell as well as we would like : in the second quarter of 2019, the profit fell by 11%, and in 4 fell by another 53%. Because of the huge losses, the company's stock fell significantly and it had to release a line of cheap video cards to cover its losses. Although even there they included this technology. This resulted in a significant loss of performance and frequent crashes.

**Conclusion.** We should assume that these video cards will become popular when their prices fall by at least 30-40%

This means that although this technology is completely new on the market and attracts the attention of a large number of people, it is not profitable to implement it in video cards.

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#### INTERNET MARKETING

*A.B. Вандич, студент группы 10507119 ФММП БНТУ,  
научный руководитель - старший преподаватель Н.П. Буланова*

*Summary - This article deals with the issue of how the Internet marketing works nowadays, its main trends, directions and ways of interaction between the brand and the client.*

*Резюме - в данной статье рассматривается, как в настоящее время работает интернет-маркетинг и его основные тенденции, направления, способы взаимодействия между брендом и клиентом.*

**Introduction.** Now marketers are working faster than ever before to keep up with the interests and preferences of the Internet audience. A huge number of tools and methods have been developed specifically for marketing and advertising professionals working in an online environment. Using the Internet technologies in marketing can bring real savings and profits. This is due to the great benefits and amenities that both consumers and firms receive. In the already existing global computerization, the role of marketing on the Internet has grown significantly.

The use of the phrase Internet marketing usually implies the use of direct response marketing strategies, which are traditionally used in direct mail, radio and television commercials, only here they are applied to the business space on the Internet. These methods have proved very effective when used on the Internet, thanks to the ability to accurately track statistics, multiplied by the ability to be in relatively constant contact with consumers. Internet marketing primarily provides consumers with the opportunity to get information about products. Any potential consumer can use the Internet to get information about the product, as well as buy it. Although, if there is no information about the product, or he does not find it, then most likely he will buy the product from the competitor.

Therefore, it is important to constantly conduct research in which we can find out the best ways to attract customers, how to better interact with them, in order to increase the effectiveness of sales and promote your brand. As a result of the research, we can identify the main modern methods used in digital marketing in 2020.